July 11, 1944. J. C. WARWICK 2,353,327

ERROR INDICATOR FOR START-STOP PRINTERS

Filed Nov. 26, 1942 5 Sheets-Sheet 1

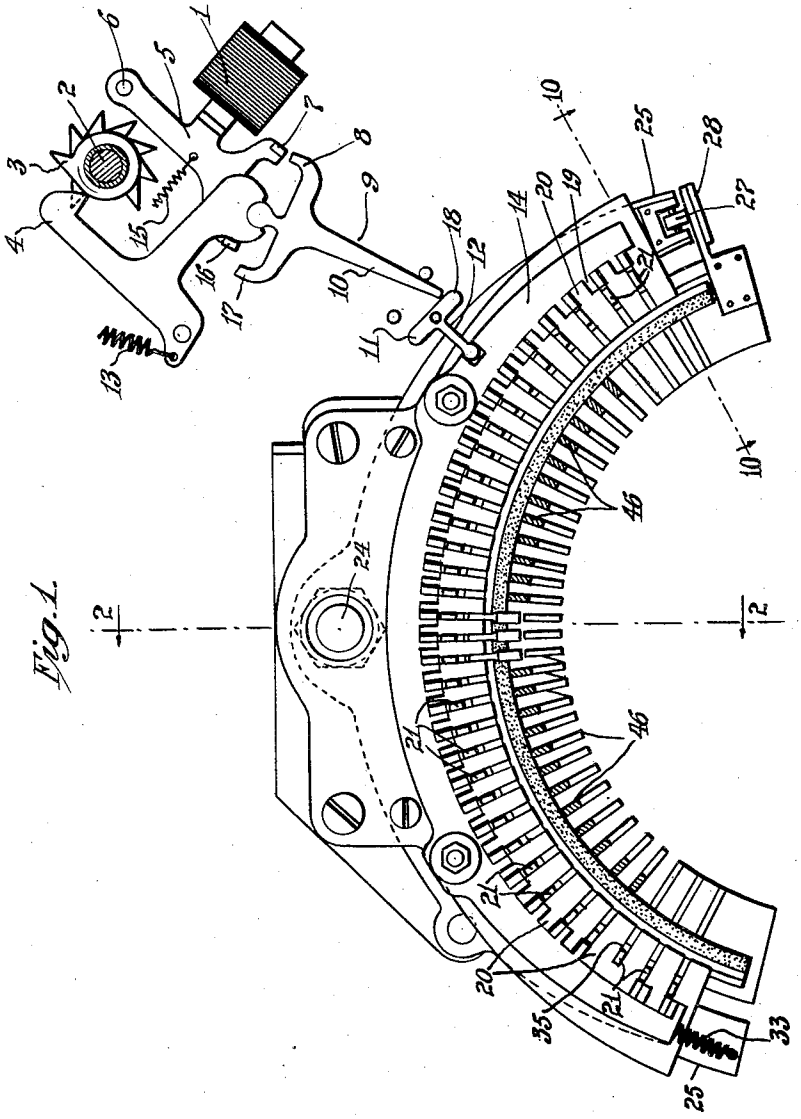


Fig. 1.

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Filed Nov. 26, 1942 5 Sheets-Sheet 2

Fig. 2.

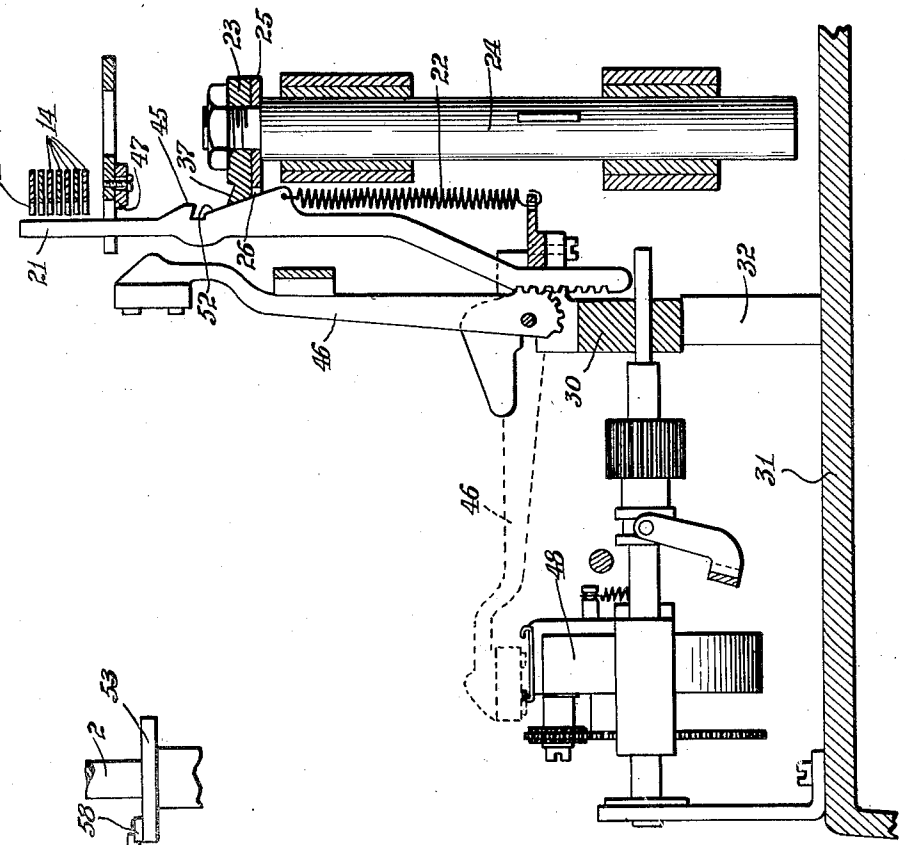
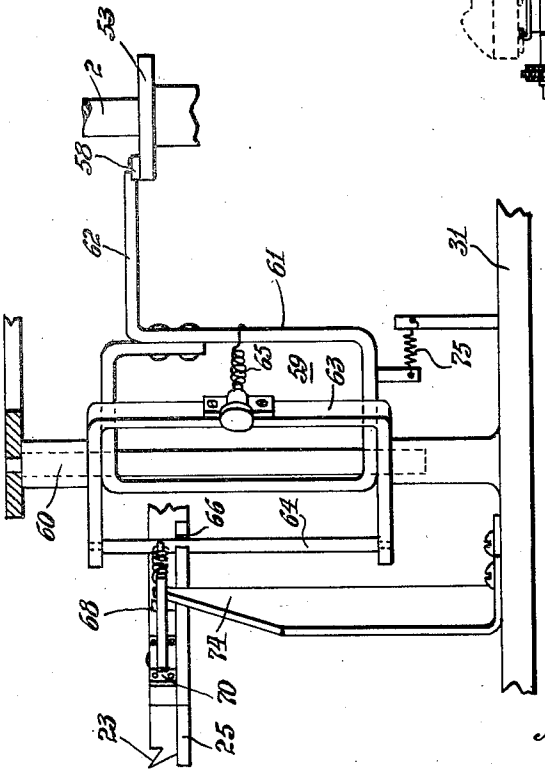


Fig. 15.



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Filed Nov. 26, 1942 5 Sheets-Sheet 3

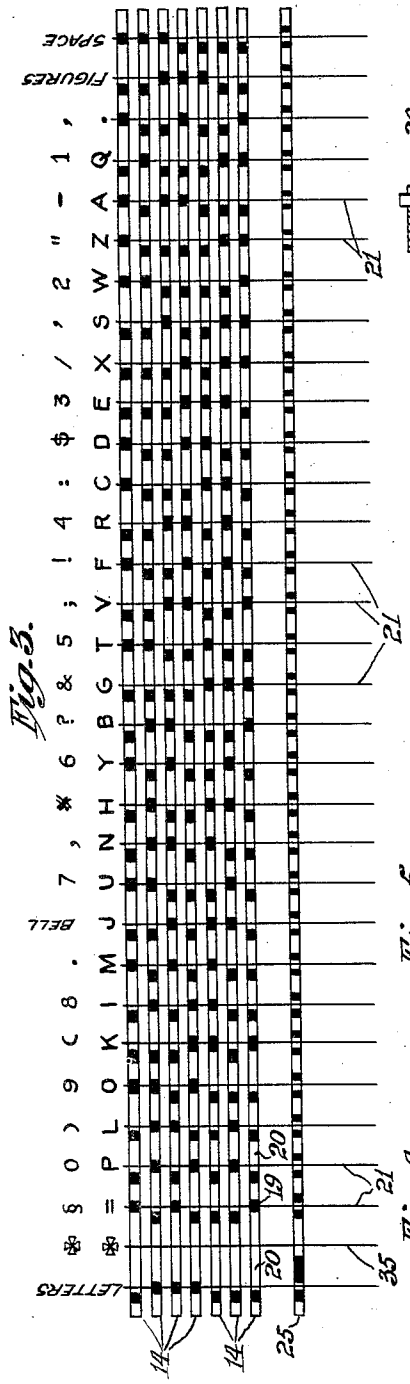


Fig. 3.

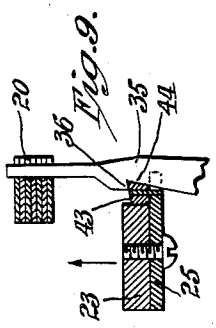


Fig. 9.

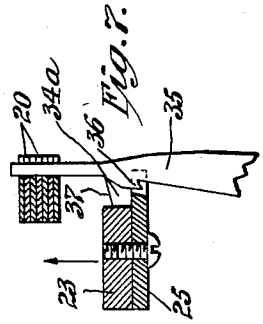


Fig. 7.

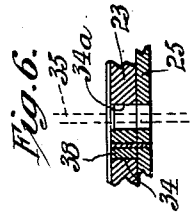


Fig. 6.

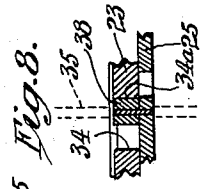


Fig. 8.

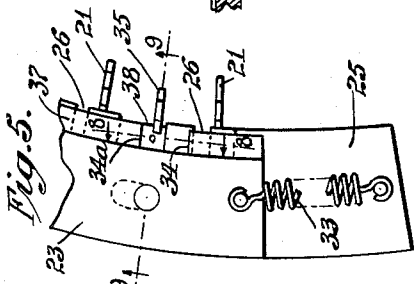


Fig. 5.

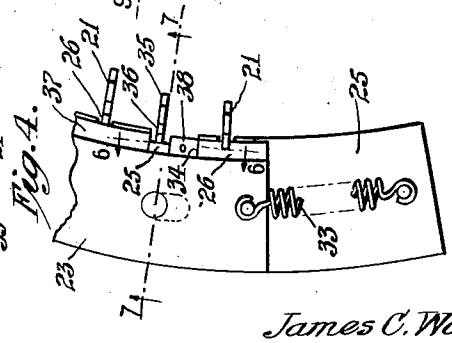


Fig. 4.

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July 11, 1944. J. C. WARWICK 2,353,327

ERROR INDICATOR FOR START-STOP PRINTERS

Filed Nov. 26, 1942 5 Sheets-Sheet 4

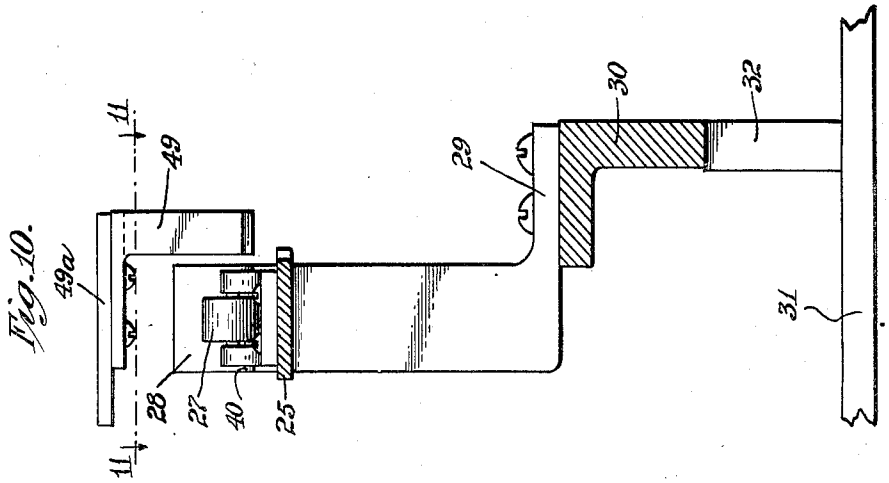


Fig. 10.

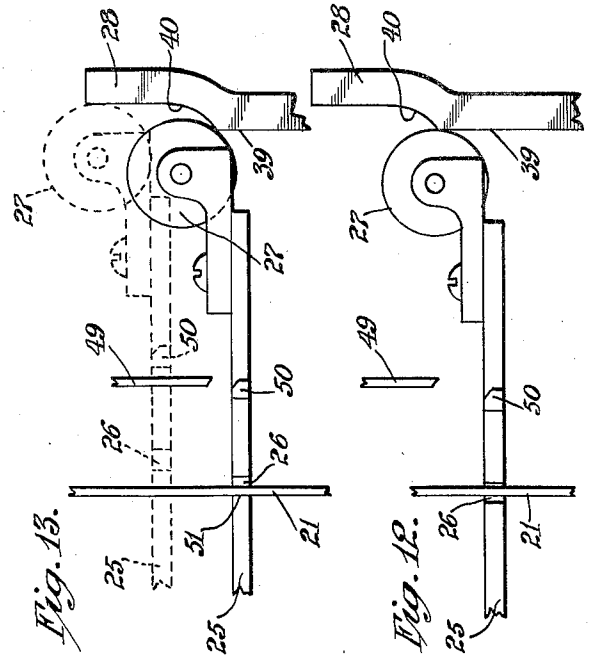


Fig. 13.

Fig. 12.

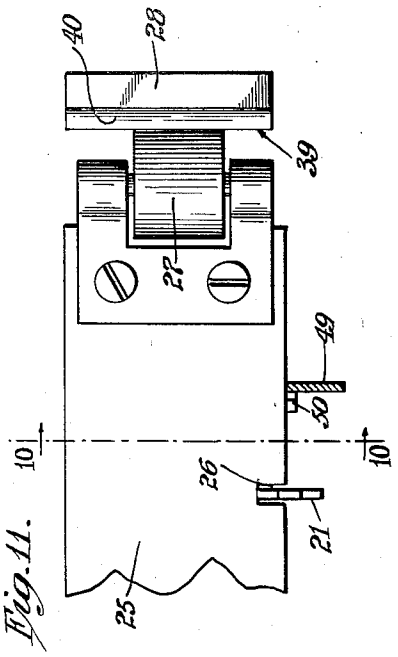


Fig. 11.

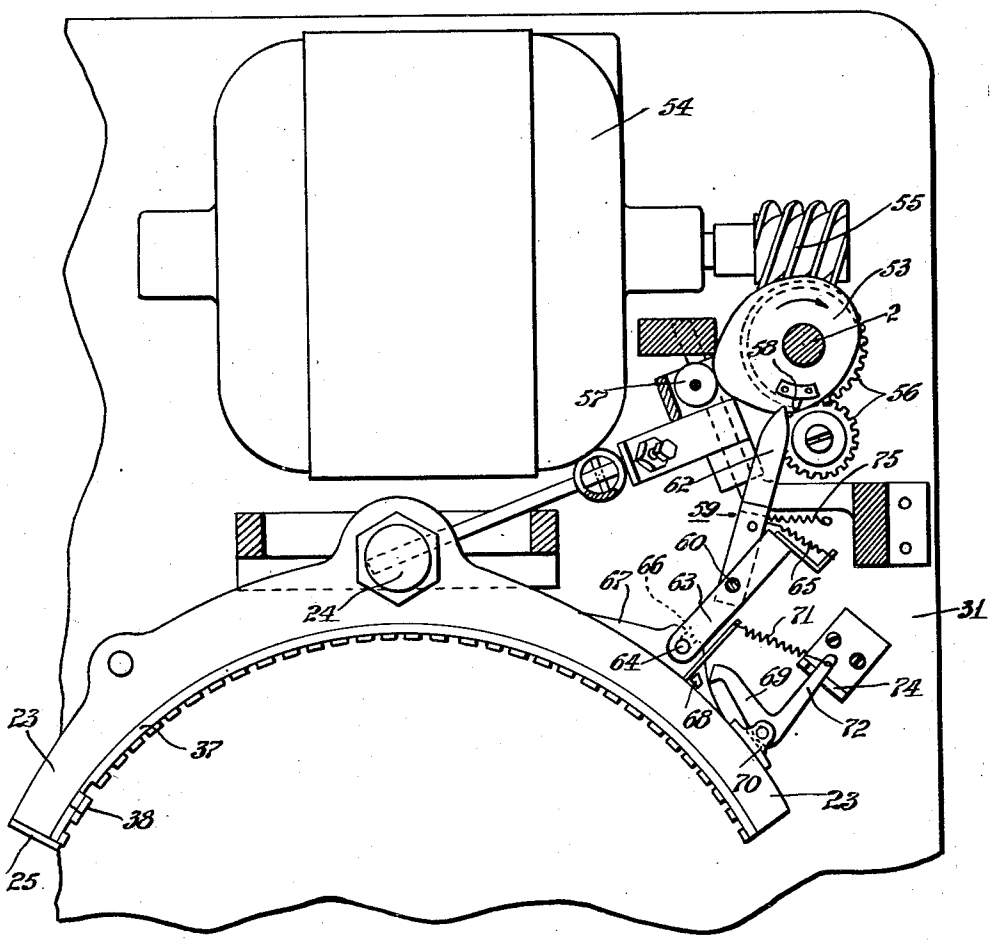
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ERROR INDICATOR FOR START-STOP PRINTERS

Filed Nov. 26, 1942 5 Sheets-Sheet 5

Fig. 14.



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Patented July 11, 1944 2,353,327

UNITED STATES PATENT OFFICE

2,353,327

ERROR INDICATOR FOR START-STOP PRINTERS

James C. Warwick, Beechhurst, N. Y., assignor to Radio Corporation of America, a corporation of Delaware

Application November 26, 1942, Serial No. 467,022

18 Claims. (Cl. 178—69)

Synchronous printing systems have been devised for transmitting and receiving signals of multiple unit codes having the same number of units for the various characters. Error indicators have been devised for these synchronous printing systems, as shown in the patent issued to James A. Spencer, April 11, 1939, No. 2,153,757, but as far as I am aware, an error indicator has not been developed for start-stop printing systems.

It is an object of this invention to devise an error indicator for start-stop printers as distinguished from synchronous printers.

It is another object of the invention to devise an error indicator for start-stop printers using an equal number of code units for the various signal characters.

Another object of the invention is to devise an error indicator that makes an error indication after a signal pull bar fails to move into signal printing position.

Another object of the invention is to provide an error selector bar having a slot for each signal pull bar and that tends to move under yielding pressure to misalign the slots with the pull bars when the signal pulses of a code unit have been received.

Another object of the invention is to relieve the pull bars of side thrust from the yieldingly pressed error selector bar after they have entered the slots therein.

Other objects of the invention will appear in the following description, reference being had to the drawings, in which:

Figure 1 is an illustration of a start-stop printer having my improved error indicator, parts being omitted that are not required for an understanding of the invention.

Figure 2 is a section taken along the line 2—2 of Figure 1, certain parts being shown that do not appear in Figure 1.

Figure 3 is a diagrammatic illustration of the selector and error bars.

Figure 4 is a plan view of the pull bars associated with the left end position of the error bar after a proper selection has been made for the letter-shift.

Figure 5 is a view similar to Figure 4, when a mis-selection has resulted.

Figure 6 is a sectional view taken along the line 6—6 of Figure 4.

Figure 7 is a sectional view taken along the line 7—7 of Figure 4.

Figure 8 is a partial sectional view taken along the line 8—8 of Figure 5.

Figure 9 is a partial sectional view taken along the line 9—9 of Figure 5.

Figure 10 is a sectional view of the thrust bar and cooperating parts, taken along the lines 10—10 of Figures 1 and 11, certain other parts being omitted.

Figure 11 is a sectional plan view of the right hand end of the error selector bar immediately after the signal pull bar has entered a slot therein.

Figure 12 is an elevation of the parts shown in Figure 10.

Figure 13 is a view similar to Figure 12 after the error bar has been moved upwards with the operating bail (not shown) sufficiently to just clear the roller from cam surface with correct selection.

Figure 14 is a modification of the error indicator.

Figure 15 is an end view of the error indicating parts of Figure 14, certain other parts being omitted.

My improvement is applicable to various forms of start-stop printers, but it has been illustrated in connection with a commercial form described in the patent of S. Morton et al., No. 1,745,633, granted February 4, 1930, in which seven selector bars and associated parts are employed to adapt it to the well-known seven unit code.

In start-stop systems the receiving cams are started in unison with the transmitting cams, by interruption of the signal current at the transmitter. This is the start of a code signal. The receiving cams are preferably rotated slightly faster than the transmitting cams and automatically stop at the end of a revolution (the end of a code character) so as to be in position for this start signal. Thus the transmitting and receiving cams start in exact synchronism and practically exact synchronism is maintained for the remainder of the revolution of the cams, due to the very short period of time required for a revolution. In a seven unit system such as I have chosen for application of my invention, there are nine signal elements in each revolution of the cams. The first element is the starting signal; the next seven, appropriately phased around the cam member circumference, are code unit signals, and the ninth is the stop signal. For each revolution of the cams there will be only, and always, three mark (current) elements among the seven code unit signals. Hence, if more or less than three mark elements are received, it is the result of an error and my improvement provides means for indicating such error.

Referring to Fig. 1, when no signals are being sent, the line magnet 1 is energized and the armature retracted as indicated. At the start of each code signal the signal current is interrupted and the magnet 1 is de-energized. This throws in the clutch (not shown) and the cam shaft 2 starts rotating. If a signal pulse is sent out (mark) when, say, the first cam 3 approaches the first selector lever 4, the remaining levers being hidden from view, the magnet 1 will be energized and the armature 5, pivoted at 6, moves prong 7 thereon so that projection 8 on sword 9 engages it as the lever 4 rides upon a cam 3. This positions the blade 10 of the sword 9 over the left arm 11 of the T-lever 12. As the lever rides off the cam 3, spring 13 turns the lever clockwise and the blade 10 revolves the T-lever 12 counterclockwise. This shifts the selector bar 14 to the right for a mark signal.

If no signal current had been transmitted when the selector lever 4 rode up on the cam 3, the line magnet 1 would not have been energized and its armature 5 would have been moved to the left by spring 15. This would have positioned the prong 16 above arm 17 and as the lever moved onto the cam the blade 10 would have been positioned over the arm 18 of the T-lever. As the lever rode off the cam, the blade 10 would have descended and moved the T-lever 12 clockwise and shifted the selector bar to the left. This would have been the shift for a spacing signal (no current).

The cam and sword mechanism are well known and to simplify the illustration of my invention only one selector lever and one T-lever have been indicated and it will be understood that the others are positioned under the ones shown.

It will thus be seen that the seven selector levers and their swords selectively position the seven selector bars to the right for signal marks and to the left for signal spaces. In the diagrammatic illustration in Fig. 3, the seven selector bars 14 are all shown shifted to the left in their spacing position. In this figure the dark blocks 19 indicate teeth and the clear spaces 20 indicate the depressions or slots between teeth.

When the letter A, for instance, is being transmitted (see Fig. 3), magnet 1 will be energized in the first, third and fourth cam positions and de-energized in the second, fifth, sixth and seventh positions, as this is the code arrangement. The descending sword blade 10 will thus move selector bars 1, 3 and 4 to the right, but at cam positions 2, 5, 6 and 7 the corresponding selector bars will be moved to the left—this position being shown in Fig. 3 for the latter bars—since the line magnet 1 will be de-energized at those points.

Thus the pull bar 21 for the letter A (shown as a mere line in Fig. 3) will move forward into the slots in the seven selector bars due to the action of spring 22 (Fig. 2) and printing operations will be initiated, as later described.

In the well-known seven unit code there are three mark signals and four space signals for each code character. If two or less, or four or more, mark signal pulses are received during the revolution of the cam due to static, interference or other causes, the pull bar 21, say for the letter A, would not have its slots aligned and it could not move into printing position. This omission of characters in printers may be erroneously interpreted with letter characters and most certainly so with numerals. It is the purpose of my invention to remedy this by printing an error indication in the form of a cross, for example, when a pull bar fails to move into position due to an error in signaling. The mechanism provided for this purpose will now be described.

Beneath the standard operating bail 23 on plunger 24 is placed a slidable error bar 25 (Figs. 1 and 2). This error selector bar has slots 26 normally opposite the message character pull bars 21 (Figs. 2, 3 and 11). On the end of this error selector bar is a roller 27 (Fig. 11) engaging a cam member 28, which has a base 29 secured on top of segment 30 (Figs. 10 and 11). This segment is secured by posts 32 on the base plate 31. The error selector bar 25 is biased by spring 33 (Figs. 1 and 4) to maintain the roller 27 against the cam surfaces of member 28. The bail 23 is slotted between 34 and 34*a* (Figs. 4 and 7) to the full depth of the lip 37, so that normally the error pull bar 35 will not have its hook 36 engaged by the bail 23 when it is moved upwards in the direction of the arrow in Fig. 7 in the printing operation. A lug 38 is secured to error bar 25 in this slot, as more clearly illustrated in Figs. 4 and 6. When the error bar 25 is moved by spring 33, under conditions later described, lug 38 is positioned at the other end of the slot in position to engage the hook 36 of the error pull bar 35 (Figs. 5 and 9).

The lug 38 is positioned at the left side (in Fig. 6) of the slot between 34 and 34*a* when the roller 27 is on the cam surface 39 of member 28 (Fig. 11) and to the right when the roller is on the cam surface 40, under the action of spring 33. Lug 38 has the same depth as the slot walls 34 and 34*a* and has slanting surfaces 43 and 44 similar to lip 37 of the operating bail 23, but it has only half the width, as shown in Figs. 4 and 6.

When a proper selection has been made, the bail 23 is raised in the well-known way and the lip 37 engages the hook 45 of the selected pull bar 21 and the latter throws the type bar 46 down toward the platen 48 (Fig. 2). When stripper bar 47 engages the slanting surface of hook 45, the pull bar is disengaged from lip 37 and the inertia of the moving type bar 46 carries it into engagement with the tape on platen 48, as well understood.

When the selected pull bar dropped into the slots 20 in the selector bars 14 (Figs. 2 and 3), it also entered deeper into its associated slot 26 in the error bar 25 in position to prevent that bar from moving to the right (Fig. 11). The roller 27 thus cannot follow the cam surface 40, as the bail 23 is raised.

When a pull bar is not selected, through error in reception, the spring 33 moves the error bar and causes the roller to follow the surface 40. It can do this, since the unselected pull bars clear the notches in the error bar on the initial upward movement. The movement of the error bar 25 to the right positions the lug 38 against wall 34*a*. Then, as the bail 23 is raised, the lug engages the hook 36 on the error pull bar and the error type bar is thrown downwards and the error indication is printed on the tape to show that the intended character was not received.

When the selected pull bar for a message character remains in a slot 26, as described in respect to errorless reception, the side thrust friction between it and the side of the slot is relieved by thrust cam 49 (Figs. 11, 12 and 13) secured to the under side segmental top plate 49*a*. This is accomplished in the following way: When errorless selection has been made and the roller 27 starts to leave cam surface 39 in the upward

movement of the bail, tooth 50 on the error bar 25 is positioned beneath the thrust cam 49, as shown by the full lines in Fig. 13. As the bail and error bar continue the upward movement, the slanting surface of thrust cam 49 engages tooth 50 and forces the error bar slightly to the left until it passes to the left of the thrust cam. This will free the selected pull bar 21 of side thrust at 51 in Fig. 13.

The thrust cam will not interfere with the indication of an error when mis-selection occurs, for in that case all the pull bars 21 will be clear of their slots 26 and the roller 27 will follow the cam surface 40, so that the tooth 50 will pass to the right of the thrust cam 49 when the error bar is raised to the height shown in dotted lines in Fig. 13.

When line magnet 1 is energized, at positions 1, 3 and 4, the first, third and fourth selector bars will be moved to the right and the pull bar for the letter A will drop into the slots in the selector bars 14, as will be evident from Fig. 2. As the well-known mechanism, shown in said Patent 1,745,633 (see the modification herein in Fig. 14), causes the plunger 24 to rise, the hook 45 on pull bar 21 for the letter A (see Fig. 2) will engage the lip 37 on the operating bail. As the plunger continues to rise, the type bar for the letter A will be moved downward against the ribbon and character A will be printed on the tape.

The pull bar for the letter A moves deeper into its slot 26 in the error selector bar and as the roller 27 leaves the cam surface 39 the pull bar stops movement of the error bar. Soon thereafter the thrust cam member 49 engages tooth 50 and forces it to the left, thus relieving the thrust on the message character pull bar, as at 51 of Fig. 13.

If one or more of the selector bars 1, 3 and 4 had failed to move to the right, or one or more additional selector bars 2, 5, 6 and 7 had failed to move to the left or had been moved to the right by spurious de-energization, or energization, of line magnet 1, due to interference or otherwise, the pull bar 21 for the letter A would not have fallen into the slots 20 in the selector bars 14. Therefore, as the plunger 24 raised the operating bail, all the pull bars would have cleared the slots in the error bar 25 and the spring 33 would have forced the roller 27 along the surface 40. This would have positioned the lug 38 (Fig. 9) on the error bar beneath the hook 36 on the pull bar 35 for the error character. As the bail continued to rise, the hook 36 on the error pull bar 35 would have engaged the lug 38 and this pull bar would have operated the type bar and printed the cross as an error indication. Since the selector bars 14 present wide slots to the error pull bar 35 (Fig. 3) for all selections, the latter does not engage the walls of the slots and no thrust relief is required. In such case, tooth 50 passes to the right of thrust cam 49, as shown in dotted lines in Fig. 13, as the roller 27 moves along cam surface 40.

When the plunger 24 moves downwards to its initial position in Fig. 2, the cam surface 40 forces the error bar 25 to the left in Fig. 13. The thrust cam member 49 is so positioned that the tooth 50 does not engage it as the roller 27 passes from surface 40 to surface 39, and vice versa.

In the modification of Fig. 14, the error bar is moved by a lever mechanism directly from the main cam 53 on the vertical shaft 2, on which the selector cams 3 are mounted. As well known, this shaft is driven by motor 54 through worm 55 and gears 56. This cam functions with cam roller 57 to raise the plunger 24 and bail 23, as described fully in said patent to Morton et al., 1,745,633. To secure the desired error indication, I fasten an auxiliary cam tooth 58 on the top of main cam 53 so that it engages and operates lever 59 pivoted at 60 (Fig. 15). This lever 59 is made up of two parts: One part 61 consists of a closed band having an arm 62 positioned for engagement with cam tooth 58; the other part consists of a U-shaped member 63 having a rod 64 extending across between its end prongs. The pivot rod 60 extends through both parts 61 and 63. A spring 65 normally keeps the parts 61 and 63 together so that they rotate as one lever about the fulcrum 60, but independent movement of the part 61 is permitted by yielding of the spring 65 when the part 63 is held from movement.

The rod 64 of the lever fits into a slot 66 of an extension 67 of the rear side of the error bar 25, which, as in the other form of the invention, is slidably secured to the under side of the bail 23. A catch pin 68 is secured to the extension 67 in position to pass under the bell crank latch 69 pivoted in member 70 secured to the back of bail 23. Spring 71 has one end fastened to the end 72 of the bell crank latch and the other end to a pin in the vertical side of the bail 23.

In the normal lowered position of the bail 23, as shown in Fig. 14, the end 72 engages a cam member 74 fastened to the base 31 or to any other stationary part. When engaged in this position by cam member 74, the latch 69 is not in position to engage the pin 68 when it is moved thereunder, but when the bail 23 starts upwards in the printing operation, end 72 leaves cam surface 74 under tension of spring 71 and the latch 69 is then in position to ride over the pin 68 and hold it and the error bar 25 in the moved position.

The operation of this modified form is as follows:

After a proper selection has been made and the bail 23 is raised, the error bar 25 is prevented from movement to the right in Fig. 14 because, as previously described, the selected pull bar will be in its slot in the error bar. Soon after the bail starts its upward movement, the cam tooth 58 engages the lever end 62 and the lever linkage 59 attempts to move as a unit in counterclockwise direction around pivot 60. However, the lever part 63 is held from movement by the engagement of rod 64 in slot 66 in the side extension of the error bar 25. Therefore, the part 61 rotates around the pivot point 60 and extends the spring 65 while the lever part 63 remains stationary. Since a proper selection has been made, the error pull bar 35 (not shown in Fig. 14) will pass freely through the slot 20 and will not make an indication, as previously described. Printing operation will then be carried out without error indication. If an error is made in the selection, the engagement of cam tooth 58 with the lever end 62 will move the lever linkage 59 as a whole about pivot point 60 and rod 64 will move the error bar 25 to the right in Fig. 14. When this takes place, the bell crank end 72 will be free of the cam 74 and latch 69 will ride over the catch pin 68 and hold the error bar 25 in position. The movement of the error bar 25 to the right produces exactly the same effect in exactly the same way as already described in connection with the first modified form of the invention and it need not be repeated here. When the bail 23 returns to its normal lowered position, the bell crank

end 72 engages the cam member 74 and releases the latch 69 from the catch pin 68 and spring 75 moves the lever linkage 59 and error bar 25 back to its normal position with the lug 38 against the side wall 34.

No anti-thrust arrangement will be required in the modification of Fig. 14. This is due to the momentary contact between cam tooth 56 and lever end 62. As soon as the cam tooth clears the lever end, spring 75 moves the lever and returns the error bar to normal position with the lug 38 against the slot surface 34, in which position the pull bars do not engage the slot walls in error bar 25. It will be evident that the spring 33 is also not required in this modification.

I have shown two different forms for securing the desired operation of an error indicating mechanism in a start-stop printer, but it will be apparent that various other modified forms may be used without departing from the spirit of the invention.

Having described my invention, what I claim is:

1. In telegraph printers, a plurality of message type levers, an error type lever, a plurality of slotted code bars, message control bars extending across said code bars adapted to produce operation of the message type levers, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of the message control bars, means for moving the message control bars into said slots when aligned adjacent thereto, an error bar extending across said message control bars, means for moving the error bar transversely of the message control bars, said message control bars being in the path of movement of the error bar and preventing its movement when in said aligned slots and means for printing an error indication when the error bar moves past the message control bars through their failure to enter the code bar slots.

2. In telegraph printers, a plurality of message type levers, an error type lever, a plurality of slotted code bars, message control bars extending across said code bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said message control bars, means for moving the message control bars into the slots of the code bars when aligned adjacent thereto, means for causing said message type levers to print message characters upon entrance of the message control bars into said aligned slots, an error bar extending across said message control bars, means tending to produce movement of said error bar transverse to said message control bars, said error bar having means for engaging the message control bars to prevent said movement only when they are in said aligned slots and means for printing an error indication when the error bar makes said movement without engaging a message control bar in said aligned slots.

3. In telegraph printers, a plurality of message type levers, an error type lever, message and error pull bars for moving said message and error type levers respectively, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said message pull bars, means for moving the selected message pull bar into the slots in the code bars when aligned adjacent thereto, an operating bail for engaging the selected pull bar to move its type levers into printing position, an error bar extending across said pull bars, means tending to move the error bar transversely of the pull bars, means on said error bar adapted to engage a pull bar in the slots of the code bars and prevent its said movement, and means for causing the bail to engage the error indicator pull bar and move the error type bar into printing position when said error bar fails to engage the selected message pull bar.

4. In telegraph printers, a plurality of message type levers, an error type lever, message and error pull bars having hooks for moving said message and error type levers respectively, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said message pull bars, means for moving a message pull bar into the slots in the code bars when aligned adjacent thereto, an operating bail normally engaging said message pull bars and holding them clear of said code bars, means for moving said bail to permit the entrance of the selected message pull bar into the aligned slots and thereafter to engage the hook on the selected pull bar and move its type lever into printing position, a slotted error bar extending across said pull bars having side walls in position to engage a pull bar in the slots of the code bars while clearing the others, means tending to move the error bar transversely of the pull bars and means for causing the bail to engage the hook of the error indicator pull bar and move the error type bar into printing position when said error bar fails to engage the selected message pull bar.

5. In a telegraph printer, a plurality of message type levers, an error type lever, message and error pull bars having hooks for moving said message and error type levers respectively, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said message pull bars, means for moving a selected pull bar into the slots in the code bars when aligned adjacent thereto, an operating bail normally engaging said message pull bars and holding them clear of said code bars, means for moving said bail to permit the selected pull bar to enter the aligned slots and thereafter to engage its hook and move the selected type lever into printing position, an error bar extending across said pull bars, means tending to move the error bar transversely of the pull bars, means on said error bar adapted to engage a pull bar in the slots of the code bars and means for causing the bail to engage the hook of the error indicator pull bar and move the error type bar into printing position when said error bar fails to engage the selected message pull bar.

6. In a telegraph printer, a plurality of message and error pull bars having hooks, a plurality of slotted code bars extending across the pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the message pull bars, means for moving the selected message pull bar into the aligned slots, an operating bail, means for moving said bail to engage the hook of a message pull bar only upon its entering the slots in the code bars, an error bar slidably mounted on said bail for movement therewith and having a slot normally in line with the hook of said error pull bar and means for moving the error bar to position its slot out of said line upon failure of the selected message

pull bar to enter the slots in said code bars, whereby the error bar engages the hook of the error pull bar when moving with said bail.

7. In a telegraph printer, a plurality of message type levers, an error type lever, message and error pull bars having hooks and connected to said message and error type levers respectively, a plurality of slotted code bars extending across said message pull bars, means tending to move said message pull bars toward said code bars, an operating bail normally holding said message pull bars clear of said code bars, means controlled by signal current for selectively moving the code bars to align slots adjacent a message pull bar, means for moving said bail away from said pull bars to permit the selected pull bar to enter the aligned slots and position its hook in the path of the bail, an error bar extending across said pull bars adapted to engage a message pull bar only when in the code bar slots, said error bar having a lug and a slot, said slot being normally positioned in line with the hook on the error pull bar and means for producing movement of the error bar to position the lug in said line upon failure of the selected message type pull bar to move into the code bar slots.

8. In a telegraph printer, a plurality of message and error pull bars having hooks, a plurality of slotted code bars extending across the pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the message pull bars, means for moving the selected pull bar into the aligned slots, an operating bail, means for moving said bail to engage the hook of the message pull bar only upon its entering the slots in the code bars, said bail having a slot in line with the hook on the error pull bar during its said movement, an error bar slidably mounted on said bail for movement therewith and having a slot normally in line with the slot in said bail, and means for moving the error bar to position its slot out of line with the slot in said bail upon failure of the selected message pull bar to enter the slots in said code bars, whereby the error bar engages the hook of the error pull bar when moved with said bail.

9. In a telegraph printer, a plurality of message type levers, an error type lever, pull bars connected to said levers and having hooks, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said message pull bars, means for moving the selected pull bar into the aligned slots, an operating bail, means for moving said bail to engage the hook on a message pull bar only upon its entering the aligned slots in the code bars, said bail having a slot in line with the hook on the error pull bar, an error bar slidably mounted on said bail for movement therewith and having a lug at one side of the slot in the bail normally out of line with the hook of the error pull bar, said error bar having teeth normally at the sides of, and notches normally opposite, the message pull bars, said teeth adapted to engage a message pull bar and prevent movement of the error bar upon said pull bar entering the aligned slots of the code bars, and means for moving the error bar to position said lug in line with the hook of the error pull bar for engagement therewith upon failure of the selected message pull bar to enter the slots in the code bars.

10. In a telegraph printer, a plurality of message type levers, an error type lever, message and error pull bars having hooks for moving said message and error type levers respectively, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent a message pull bar, means tending to move said message pull bars toward said code bars, an operating bail normally holding said message pull bars clear of said code bars, means for moving said bail away from said pull bars to permit the selected pull bar to enter the aligned slots and position its hook in the path of the bail, an error bar slidably mounted on said bail, a cam, a cam follower on said error bar, a spring tending to cause said follower to move along the surface of said cam during movement of said bail, means on said error bar for engaging a message pull bar only when it is in the code bar slots and preventing said follower from moving along said cam, and means for causing the moving bail to engage the hook of of the error pull bar and move its type lever to printing position when said follower moves along the cam surface through absence of a message pull bar in the slots of the code bars.

11. In a telegraph printer, a plurality of message type levers, an error type lever, message and error pull bars having hooks connected to said message and error type levers respectively, a plurality of slotted code bars extending across said pull bars, means tending to move said message pull bars toward said code bars, an operating bail normally holding said message pull bars clear of said code bars, means controlled by signal current for selectively moving the code bars to align slots adjacent a message pull bar, means including a cam for moving said bail away from said message pull bars to permit the selected one to enter the aligned slots and position its hook in the path of the bail, a lug on said cam, an error bar slidably mounted on said bail, a pivoted lever having one end in position to engage said lug and the other end engaging said error bar, said lug and lever producing movement of the error bar across the pull bars when no pull bar moves into the aligned slots, means on said error bar for engaging a message pull bar only when it is in the code bar slots to prevent its said movement, and means for causing the moving bail to engage the hook of the error pull bar and move it into printing position when said error bar makes said movement, said lever having means for yielding without moving the error bar upon engagement with said lug when a message pull bar is in the aligned slots.

12. In a telegraph printer, a plurality of message type levers, an error type lever, pull bars having hooks for moving said type levers, a plurality of slotted code bars extending across the pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected message pull bar, means for moving the selected pull bar into the aligned slots, an operating bail, means including a cam for moving said bail to engage the hooks of the message pull bars upon their entering the slots in the code bars, said bail having a slot through which the hook on the error pull bar normally passes upon said movement of the bail, an error bar mounted on said bail for movement therewith and having a slot normally in line with the slot in said bail, a lug on said cam, and a pivoted lever having one end in position to engage said lug and the other end engaging said error bar to position its slot out of line with the slot in

said bail upon failure of the selected pull bar to enter the slots in said code bars, said lever having means for yielding without moving the error bar upon engagement with said lug when the selected pull bar is in said aligned slots.

13. In telegraph printers, a plurality of message and error pull bars, a plurality of slotted code bars extending across the pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected message pull bars, means for moving the selected pull bar into the aligned slots, an operating bail, a cam adapted to cause said bail to move toward the hooks of said pull bars, means for causing the hook of the selected message pull bar to engage the bail upon its entering the aligned slots in the code bars, said bail having a slot through which the hook on the error pull bar normally passes upon said movement of the bail, an error bar mounted on said bail and having a lug normally at one side of the slot in the bail and out of line with the hook of the error pull bar, said error bar having teeth at the sides of, and notches opposite, the message pull bars, said teeth adapted to engage the message pull bars and prevent movement of the error bar upon the selected message pull bar entering the slots of the code bars, a lug on said cam, a pivoted lever having one end in position to engage said lug and the other end engaging said error bar to position said lug at the other side of the slot in said bail in line for engagement with the hook of the error pull bar upon the bail moving with no message bars in the aligned slots in the code bars and means for causing said lever to yield when the error bar is held from movement by a message pull bar in said aligned slots.

14. In a telegraph printer having an error indicator, a plurality of type levers, a plurality of slotted code bars, control bars extending across said code bars adapted to produce operation of the type levers, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of the control bars, means for moving the selected control bar into said slots when aligned adjacent thereto, an error bar extending across said control bars for operating the error indicator, said control bars being in the path of movement of the error bar only when in said aligned slots, means for moving the error bar into engagement with the selected control bar in the aligned slots, and means for relieving the control bar of the side thrust of the error bar.

15. In a telegraph printer having an error indicator, a plurality of type levers, a plurality of slotted code bars, control bars extending across said code bars adapted to produce operation of the type levers, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of the control bars, means for moving the selected control bar into said slots when aligned adjacent thereto, an error bar extending across said control bars, said control bars being in the path of movement of the error bar only when in said aligned slots, means for moving the error bar into engagement with the selected control bar in said aligned slots and means for reversely moving the error bar to relieve the side thrust of the engaged control bar.

16. In a printer having an error indicator, a plurality of type levers, pull bars having hooks for moving said type levers, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said pull bars, means for moving a pull bar into the slots in the code bars when aligned adjacent thereto, an error bar extending across said pull bars, means for moving the error bar into engagement with the pull bar in the aligned slots of the code bars, means for engaging the hook of the pull bar in said aligned slots and moving its associated type bar into printing position and means for moving the error bar to relieve the pull bar of side thrust of the error bar before said means engages said hook.

17. In a printer having an error indicator, a plurality of type levers, pull bars having hooks for moving said type levers, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said pull bars, means for moving a pull bar into the slots of the code bars when aligned adjacent thereto, an operating bail for engaging the hook of the selected pull bar and moving it into printing position, an error bar slidably mounted on said bail having slots normally adjacent said pull bars, means for moving the error bar to bring the wall of a slot into engagement with the pull bar in the aligned slots of the code bars and means for reversely moving the error bar to relieve the pull bar of side thrust of the slot wall before the bail engages said hook.

18. In a printer having an error indicator, a plurality of type levers, pull bars having hooks for moving said type levers, a plurality of slotted code bars extending across said pull bars, means controlled by signal current for selectively moving the code bars to align slots adjacent the selected one of said pull bars, means for moving a pull bar into the slots in the code bars when aligned adjacent thereto, an operating bail for engaging the hook of the selected pull bar and moving it into printing position, an error bar on said bail having teeth, means for moving the error bar to bring one of said teeth into position for engagement with the pull bar in the aligned slots of the code bars and means for reversely moving the error bar to relieve the pull bar of side thrust of said tooth before said bail engages said hook.

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